

In the Claims:

Sub B'

1. (currently amended) A method for identifying the orientation in free space of a preselected object locating device, from a projected image of the object locating device in a view plane of a video camera, comprising steps of:

detecting the object locating device, from the image by recognizing relative positions of points merely disposed on the object's locating device's image within the view plane;

calculating corresponding coordinate positions of the points at an object on the locating device's position in free space based upon the relative positions and known camera geometric dimensions; and

converting the coordinate positions into the location of the object locating device.

2. (currently amended) The method of claim 1 wherein the points on the object's locating device's image are three preselected co-linear points.

3. (currently amended) The method of claim 1 wherein the object locating device comprises an alignment indicator.

4. (currently amended) The method as defined in claim 1 wherein the converting comprises identifying a location and pointing direction of the object locating device in the free space.

5. (currently amended) The method as defined in claim 1 wherein the preselected object locating device comprises a wand for communicating a pointing direction in an augmented-reality display system, the detecting comprising detecting pixel location on the view plane of beads on the wand corresponding to the points.

6. (original) The method as defined in claim 5 wherein the beads comprise a predetermined color and the detecting includes detecting the pixel locations representing a property of the color.

7. (original) The method defined in claim 6 wherein the color property is at least hue.

8. (original) The method as defined in claim 5 wherein the detecting includes finding a center pixel location of each of the beads.

Q² 9. (currently amended) The method as defined in claim 1 wherein the known camera geometric dimensions comprise a given distance between a view point and a view plane of the camera, and the calculating comprises converting the relative positions of the points based on the given distance and the known spacing of the points, to an object distance in the free space between the predetermined object locating device and the view plane.

10. (original) A method for determining a location of a wand in a preselected free space from a video image of the wand, wherein the wand comprises three equidistantly-spaced, co-linear beads, comprising steps of:

capturing the video image of the wand on a view plane of a video camera system wherein the image is represented by a frame memory including relative positions of the beads;

determining centers of the beads on the view plane and relative spacings between the centers; and,

calculating coordinate positions of the beads in the free space based upon the relative spacings and known camera system geometries of generating the video image.

11. (original) The method as claimed in claim 10 wherein the wand includes an alignment indicator and the calculating includes determining a pointing direction of the wand from the alignment indicator and the coordinate positions of the beads.

12. (original) The method as claimed in claim 11 wherein the beads comprise a distinctive indicia from a background setting of the video image and the determining includes recognizing the distinctive indicia.

13. (original) The method as claimed in claim 10 wherein the calculating comprises unprojecting the video image and verifying that the coordinate positions are reasonable representations of the wand in the free space.

Q2
14. (currently amended) A system for identifying a position and pointing direction of a preselected ~~object~~ locating device in a three dimensional free space from an image thereof captured in a video camera wherein the object includes a plurality of equidistantly-spaced, co-linear indicia disposed thereon, and the camera includes a known system geometry, the system comprising:

a frame memory comprising a pixel representation of the image; and
a processor for detecting relative positions of the indicia in a view plane from the pixel representation, and for computing corresponding coordinate positions of the indicia of the object in the free space merely from the relative positions and the known system geometry.

15. (currently amended) The system in claim 14 wherein the ~~object~~ locating device further includes an indicator for indicating a pointing direction of the object.

16. (currently amended) The system as defined in claim 14 wherein the processor further includes means for verifying that the coordinate positions are consistent with a plausible free space position of the ~~object~~ locating device.